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ABSTRACT

Transborder data flow has become a topic of much discussion and concern among the governments of the industrialized world, developing countries, international organizations, and many multinational corporations. Of late, the implications to the library community have been acknowledged. In 1983, the International Federation of Library Associations (IFLA) Section on Information Technology initiated this study to investigate any barriers to the flow of bibliographic information, and to make proposals for solutions and actions. To introduce a framework for studying the problems concerning transborder flow of bibliographic data, this paper describes several categories of organizations or institutions that play a major role in this process. These include: national libraries or national bibliographic agencies; bibliographic utilities; commercial database vendors; a publicly-supported, international online network service; international bibliographic information systems; and abstracting and indexing services. Following an introduction, this document is divided into three sections. The first, "Flow of Bibliographic Data," covers major participants, the present flow of bibliographic data, estimates of future flow of bibliographic data, and comparison with international circulation of other types of data. The section on "Barriers to the Flow of Bibliographic Information" describes such barriers and their consequences. A final section includes recommendations and proposals for action. The appendix is a chart outlining certain trade restrictions and showing some of their potential effects on telecommunications, data, and information services. (THC)

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— LENORE S. MARUYAMA

— TRANSBORDER FLOW
OF BIBLIOGRAPHIC DATA

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International Federation of Library Associations and Institutions
IFLA Professional Reports, No. 7

TRANSBORDER FLOW OF BIBLIOGRAPHIC DATA

BY

Lenore S. Maruyama
Maruyama Associates, Inc.
Washington, D.C., USA

IFLA Section on Information Technology

IFLA Headquarters, The Hague, 1985

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PREFACE

Transborder data flow has become a topic of serious discussion and concern among the governments of the industrialized world, developing countries, international organizations, and many multinational corporations. Although the issue up to this point in time has been of major concern to the business community, it has implications to the library community and therefore should be monitored.

The IFLA Section on Information Technology in 1983 initiated this study on "Transborder flow of bibliographic data." The two main objectives of the study were to investigate any barriers to the flow of bibliographic information and to make proposals for solutions and actions.

The interconnection of data bases among nations is of vital importance to the exchange of information. The first step therefore should be awareness of the problems by the library and information profession which could affect the free flow of bibliographic information. It is hoped that this publication will serve as a source to enlarge our knowledge on the topic of transborder data flow.

The Information and Technology Section expresses its appreciation to Lenore S. Maruyama who carried out the study and Henriette D. Avram who acted as technical monitor for IFLA.

It should be noted that the information contained in the document was gathered in late 1983 and early 1984. Literature in this field becomes quickly out of date. Therefore it may be that some descriptions of institutions and projects do not correspond to the actual status.

--Christine Bossmeyer--

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A number of people assisted me with this project by providing materials, answering questions, or bringing items to my attention. In particular, I would like to thank James Wood and Ralph O'Dette, Chemical Abstracts Service; Hugh P. Donoghue, Control Data Corporation; Stephen P. Davis and Agnes A. Ferruso, Library of Congress; Joseph Judy (a former staff member of) and Philip Turner, National Agricultural Library; Sheldon Kotzin, National Library of Medicine; and Mary Ellen Jacob, OCLC. Finally, the assistance of Henriette D. Avram of the Library of Congress and technical monitor for this project is gratefully acknowledged.

SUMMARY

Transborder flow of bibliographic information involves online or tape transmission among nations. Bibliographic information is one of several types of non-personal data that are transmitted in transborder flows, and although it constitutes a relatively small component in terms of revenue or volume of activity, it plays an important role in research in all fields of knowledge, on the educational process, and on industrial, technical, agricultural, or cultural development throughout the world. Barriers imposed on the flow of bibliographic data could, therefore, have a serious effect on the economic well-being of a nation.

To set the framework for the problems concerning transborder flow of bibliographic data, this paper describes several categories of organizations or institutions that play a major role in this area. These include national libraries or national bibliographic agencies; bibliographic utilities (e.g., OCLC, Inc., or the University of Toronto Library Automation Systems); commercial data base vendors; a publicly-supported, international online network service (Euronet/DIANE); international bibliographic information systems (e.g., the International Nuclear Information System or the Agricultural Information System for Agricultural Sciences and Technology); and abstracting and indexing services (e.g., Chemical Abstracts Service or the Institute for Scientific Information).

The amount of bibliographic data flowing across national borders is extremely difficult to determine with any degree of accuracy because there is no common denominator, such as revenue or volume of activity, among the various groups that are actively involved. In addition, several other factors come into play: (1) A certain

percentage of records transmitted by tape or by online communications consists of updates, revisions, or deletions to records already issued; (2) the number of end-users for either tape or online data is generally not known; (3) the same records could be transmitted several times among different countries or between countries; and (4) the same records are also available through several sources.

Similar caveats must be made when attempting to estimate the transborder flow of other non-personal data. If provided at all, the flows are described in terms of dollar amounts (e.g., total costs for the activity or savings) or possibly in terms of volume of activity. Unlike the growth of online bibliographic data bases, which is expected to level off in the next few years, the growth of source data bases consisting of numeric, textual, or a combination of numeric and textual data is expected to continue for some time.

While investigating the impediments to the flow of bibliographic information, it was determined that several of the trade barriers to telecommunications, data, and information services could also apply. These barriers include restrictions on the availability of leased lines or on the degree of interconnection of private lines leased by data processing and data base service vendors or transnational corporations; technical/standards barriers imposed on computer and data telecommunications hardware; access to Euronet; policies requiring data processing functions to be performed within a country; telecommunications rates and rate increases predicated on considerations other than cost; a value-added tax on information; or restrictions on commercial visas that limit the ability of vendors to market and maintain their services. Other barriers, such as import controls on data communications hardware or restrictions on technology transfer, could also affect transborder flow of bibliographic data. In

addition, the presence of copyright protection for machine-readable bibliographic data in some countries constitutes a barrier unique to the bibliographic world.

Policy-makers at national and international levels have acknowledged the impact of these barriers on transborder data flow and have attempted, at least at the international level through groups like the Organization for Economic Cooperation and Development, to reconcile the differences among nations. Impediments to the transborder flow of bibliographic data ultimately affect the availability of publications and particularly the development of rapid, efficient, high-quality electronic document delivery where economies of scale are necessary to provide such a service at an affordable cost.

Since most of the problems affecting transborder flow of bibliographic information originate in the broader area of all transborder data flow, their resolution lies in the formulation of policies at the highest level of government where trade agreements, protocols, or guidelines are initiated. The library and information service profession should take the following courses of action:

- Effects of barriers to transborder flow of bibliographic information, real or potential, need to be communicated to the appropriate agencies. Most officials recognize the pivotal role of information in a nation's economy, and in many instances, the negative impact on bibliographic data was not intended.
- In order to educate the officials, the library and information profession has to educate itself on the issues related to transborder data flow. IFLA or some other group could be responsible for the overall effort to identify and obtain the significant reports on this topic, with the actual dissemination handled by the

national library association and/or the national library in the individual countries. A bibliography of these reports should be compiled, and translations into the appropriate languages should be provided. Regular updates, perhaps on a biennial basis, could be presented at IFLA conferences.

- More and better communications should be established among the components of the public/private, for-profit/not-for-profit sectors in the library and information communities because the problems of the Information Age, such as transborder data flow, are not unique to any one category but will eventually affect all groups.
- The library and information profession should have a better understanding of the economic issues related to online data bases, both bibliographic and non-bibliographic.

1. INTRODUCTION

The concept of Transborder Data Flow generally refers to "the electronic movement and/or processing by a computer. It, therefore, involves communications from a terminal to a computer, computer to computer, and computer to a terminal."1/ For bibliographic information, this definition is expanded to include the transmission of data by tape, the medium in which the majority of machine-readable bibliographic records are obtained.

If one equates "data" with "information," the concept of transborder data flow is not new and could encompass the printed communications that have existed for centuries, films, or broadcast media such as radio or television. The origins of the term, however, are much more recent. It was first used in the context of international communications at a seminar on privacy protection sponsored by the Organization for Economic Cooperation and Development ten years ago. At that time, discussions about transborder data flow focused on the ability to circumvent the privacy protection laws of an individual country if data on citizens of that country were held in computers located outside the country and accessible from other locations via telecommunications lines. By 1977, the use of the term had been extended to include almost any kind of computer-generated data.2/

Protection of personal data, the first of the transborder data flow problems to receive attention in the international arena, has seen substantial progress in recent years. Adoption of the OECD guidelines that were issued in September 1980 to protect privacy and individual liberties and to develop free flow of personal data by all but two member countries is evidence of their commitment to these principles. In addition, 182

corporations and trade associations in the United States have publicly endorsed the guidelines.^{3/} The Council on Europe initiative, which was also completed in 1980, is restricted to member European nations but is based on binding international treaty. Sweden and France have signed the treaty, and other countries are expected to follow suit shortly. These developments, however, do not mean that problems no longer exist. Laws or regulations for (personal) data protection requiring the approval for creation of data bases or for export of personal data or covering legal persons, i.e., corporations or institutions, as well as individuals, remain of concern to multinational corporations.

Non-personal data cover a wide range of possibilities, such as remote-sensing data from satellites, numeric data bases for economic models and forecasting or census information, financial data collected by a corporation, computer-aided design or manufacturing, airline reservations data, and, of course, bibliographic information. It should be noted that the distinction between personal and non-personal data is not always clear because a data base could contain both kinds of information. While there is general agreement on the need for personal data protection, transborder flow of non-personal data raises a number of issues related to economic, national sovereignty, or cultural policies of individual countries.

Transborder flow of bibliographic data constitutes a small percentage of the total flow of non-personal data. The cumulative revenue from sales of data base producers, which include printed products and offline services like tapes or microform products, is estimated to be just over \$11 billion (of which online services account for \$2 billion)^{4/} whereas total U.S. exports in telecommunications and information goods (excluding services) in 1977 alone were in excess of \$12 billion.^{5/} Relatively few problems exist that concern bibliographic data directly; however, trade barriers imposed by individual countries or groups of countries can have a detrimental effect on

the flow of bibliographic information, particularly when these barriers involve telecommunications or data processing. The consequences of these barriers on research in all fields of knowledge, on the educational process, on industrial, technical, agricultural, or cultural development are difficult to measure although nearly everyone acknowledges the pivotal role of bibliographic information in these areas.

This paper attempts to describe the existing participants in transborder bibliographic data flows, estimate the amounts of data involved at present and in the future, and provide a comparison with other types of data flows. Real or potential barriers are discussed from the broader perspective of general trade barriers and the narrower view of barriers unique to bibliographic data. Finally, proposals for action are presented.

NOTES:

- 1/ Hugh P. Donaghue, "Implications of Transborder Data Flows to Library Networks." IFLA Journal, 9, no. 1 (1983): 34.
- 2/ Organization for Economic Cooperation and Development, Directorate for Science, Technology, and Industry, Synthesis Report on the Application of the Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data. DSTI/ICCP/83.17. 1st rev. (Paris: OECD, 23 Sept. 1983), p. 39, 42-44.
- 3/ Organization for Economic Cooperation and Development, Directorate for Science, Technology, and Industry, Working Party on Transborder Data Flows,

Transborder Data Flows: An Overview of Issues. DSTI/ICCP/83.29. 1st rev.
(Paris: OECD, 1 Sept. 1983), p. 3.

4/ Organization for Economic Cooperation and Development, Directorate for Science, Technology, and Industry, The International Data Market Revisited. G. Anderla assisted by J. H. Petrie. DSTI/ICCP/83.25. (Paris: OECD, 20 Oct. 1983), p. 3.

5/ Henry Geller, "Statement . . . before the Subcommittee on Government and Individual Rights, Committee on Government Operations, U.S. House of Representatives, March 27, 1980." In U.S., Congress, House, Committee on Government Operations, International Data Flow; Hearings before a Subcommittee . . . 96th Congress, 2nd sess., March 10, 13, 27 and April 21, 1980. (Washington: U.S. Govt. Print. Off., 1980), p. 325.

2. FLOW OF BIBLIOGRAPHIC DATA

2.1 MAJOR PARTICIPANTS

Although the curtailing of transborder flow of bibliographic information would eventually affect users in virtually all the libraries and information centers in the world, the most immediate impact of such an action would be on the data base producers and vendors in the public/private, for-profit/not-for-profit sectors. For this reason, the discussion in this section is limited to the following categories of organizations or institutions that play a major role in transborder flow of bibliographic data: (1) national libraries, (2) bibliographic utilities, (3) commercial data base vendors, (4) a publicly-supported, international online network service, (5) international bibliographic information systems, and (6) abstracting and indexing services. Also, this discussion is not intended to be a definitive description of the organizations and their services but to provide sufficient background for the problem issues discussed in Chapter 3.

Relatively few of the **National Libraries** or **National Bibliographic Agencies** are both producers and recipients of bibliographic records from international sources. Table 2-1 lists the agencies that have implemented or are in the process of planning tape distribution services for bibliographic records.^{1/} Of the nine agencies that have actually implemented tape distribution services, only one (the British Library) has also provided online access to its data base from other countries. (The U.S. National Library of Medicine, which has both tape distribution services and online access from other countries, is discussed separately in this section.)

TABLE 2.1 COUNTRIES WITH MARC TAPE DISTRIBUTION SERVICES

Country	Library/Agency	Status
Australia	National Library of Australia	Implemented
Brazil	Biblioteca Nacional	Projected ?
Canada	National Library of Canada	Implemented
Denmark	Kongelige Bibliothek	Implemented
France	Bibliothèque Nationale	Implemented
Italy	Istituto Centrale per il Catalogo Unico Della Biblioteche Italiane	Projected for 1985
Netherlands	Koninklijke Bibliotheek, PICA Bureau	Projected for 1984
New Zealand	National Library of New Zealand	Implemented
Norway	Universitetsbiblioteket	Implemented
South Africa	National Library Advisory Council	Projected for 1984
South Korea	Central National Library	Projected
United Kingdom	British Library	Implemented
United States	Library of Congress	Implemented
Venezuela	Biblioteca Nacional	Implemented

Transborder flow of bibliographic data is much more prevalent than the table indicates if one includes the number of national libraries or the number of non-national libraries or bibliographic agencies that are only recipients of bibliographic tape services from other countries. For example, the total number of foreign subscribers to the (U.S.) Library of Congress tape distribution services is twenty-nine, indicating that obtaining machine-readable bibliographic information from foreign sources is a fairly common characteristic of the bibliographic control apparatus in many countries. All of

the libraries or agencies that have implemented their tape distribution services also have agreements with at least one other country to obtain machine-readable records for the imprints of that country in exchange for the machine-readable records for its own imprints.

The **U.S. National Library of Medicine** performs the role of a national bibliographic agency in the field of medicine. It creates over twenty data bases, ranging in size from MEDLINE with over 4 million records to the History of Medicine file with about 60,000 records. NLM also creates several non-bibliographic data bases, such as the Toxicology Data Bank which contains chemical, physical, pharmacological, and toxicological facts and data extracted from eighty major textbooks and handbooks. It has licensing agreements with fourteen foreign centers on a quid pro quo arrangement. The foreign centers perform indexing for the journals published within their countries or contract with a firm in the United States to do the indexing equivalent to the cost of the tapes (which, if loaded online by the center, includes a use fee structure) or the cost of direct online access to the NLM data bases. Eight of the fourteen centers access the data bases directly. Since NLM also sells its tapes, the users of services from DIALOG, SDC (System Development Corporation), or BRS (Bibliographic Retrieval Services) in other countries have online access through these vendors.

Although **Bibliographic Utilities** provide online access to their data bases from other countries, the range and quality of the services may be limited. For example, users in the United Kingdom, West Germany, Finland, Canada, Mexico, and Australia can access the OCLC (Online Computer Library Center) data base in the United States, but in almost all of these countries, only dial-up access is available. Thus, the full range of input and update capabilities, which constitute the key components of the OCLC system but which can be performed efficiently only via direct leased lines, is not

available. OCLC, however, is negotiating to upgrade the services in the U.K. by providing direct lines, and a direct line has been installed for several years between OCLC and the National Library of Canada for the CONSER (conversion of serials) project. Where only dial-up access is available, the principal use of the OCLC data base is for information retrieval or for interlibrary loan, with the exception of Mexico where the user library is using the cataloging system. Information retrieval is also the primary use for the British Library's network, BLAISE, which can be accessed via Euronet/DIANE within the European Community.

The University of Toronto Library Automation Systems (UTLAS) has several customers in the United States and Japan that access its data base(s) through value-added networks for the full range of services, including offloading records on to tape (at UTLAS) for local system processing or downloading records to a local system (a microcomputer located at the library itself). It is unique, at least among the four major library networks or bibliographic utilities in North America, in that it obtains the largest number of tape services from other countries. (In general, these tapes are received through the exchange agreements arranged by the National Library of Canada that were mentioned in the first part of this section.) Work is also proceeding on the development of distributed data bases that would provide replicas of the data bases located in Toronto, possibly in other provinces in Canada or in other countries. This service is expected to be available in the first quarter of 1985. UTLAS has also signed a contract with an information broker in the Washington, D.C., area to furnish documents ordered through the UTLAS online acquisitions system, in which the broker acts as an acquisitions source. The broker specializes in furnishing U.S. government documents and reports from such agencies as the Government Printing Office or the National Technical Information Service.

It should be noted that networks like OCLC offer many more services to its members than what is described in this section. Only those services that are part of the transborder data flow have been mentioned. Also, other bibliographic utilities in the United States or in other countries may be involved in transborder data flow, but the level of activity did not warrant mentioning them specifically.

The **Commercial Data Base Vendors** constitute a subset of the online data base vendors, of which there are estimated to be 272 worldwide. Three of the larger commercial bibliographic online services, DIALOG Information Services (Lockheed), SDC Search Service (System Development Corporation), and BRS (Bibliographic Retrieval Services) are described briefly in this section because at least two of them have encountered difficulties vis-a-vis their potential customers in other countries that are the direct result of barriers to transborder data flow. These services originate in the United States, offer access to their data bases through value-added networks, other time-shared telecommunications access through the local PTTs, or directly to the vendors' computer centers, and provide an electronic mail facility to order documents and a full-text document delivery capability for articles listed in some of their data bases (the latter by DIALOG only).

As an increasing number of non-bibliographic data bases are produced, DIALOG, SDC, and BRS have included them in their services. At present, between thirty-five to forty percent of the data bases from these vendors are non-bibliographic. (In this context, data bases consisting of an index to patents issued or biographical directories are considered non-bibliographic. Admittedly, the distinction between bibliographic and non-bibliographic is hazy in many instances.)

Euronet/DIANE, a program operated by the Commission of the European Communities, is a combination of a PTT-operated data transmission facility (Euronet) and a framework for European-based online information services (DIANE for Direct Information Access Network for Europe). For countries that do not have a national public network, Euronet provides public network services as part of an agreement between the EEC and the Consortium of Postal and Telecommunications Administrations of the participating EEC countries. From the seventy online data bases that were available when it was implemented in March 1980, Euronet/DIANE has grown to have over 370 data bases available. Of these data bases, approximately forty-seven percent are considered non-bibliographic.^{2/} A feature of particular interest in the area of information retrieval is the implementation of the DIANE Common Command Language, which is available through ten of the online host services covering approximately eight-five percent of the bibliographic files in the network and which provides one set of search commands instead of a different one for each retrieval system.

The **International Nuclear Information System (INIS)** and the **Agricultural Information System for Agricultural Sciences and Technology (AGRIS)** have several common characteristics: They are operated by international organizations (the International Atomic Energy Agency and the Food and Agricultural Organization, respectively, of the United Nations); input to the system is handled by sending tapes to the international center from the national centers;^{3/} permission must be obtained from the other participating countries/agencies if online access is available outside the individual member country; and both systems provide varying degrees of support for document delivery for the items included in the respective data bases. The processing and data base maintenance for both systems are handled by INIS in Vienna.

Policies related to access to the resulting data bases were revised in 1982. Participating countries in both systems can obtain tapes containing the records from all inputting countries and can make the data available offline or online without any restrictions within their own borders. If, however, one country provides online access through a data base vendor that operates in other countries, permission from each of the other countries must be obtained. For example, the national liaison center for AGRIS in the United States, the National Agricultural Library, requested (and obtained) permission from each of the 120 national, regional, or international centers before mounting the tapes on DIALOG.

The **Abstracting and Indexing Services** are discussed as a separate category because a number of them provide tapes through licensing agreements. The Chemical Abstracts Service in Columbus, Ohio, a division of the American Chemical Society, has licensed twenty-five centers in nineteen countries (including the United States), and nine of these centers provide online services. About seven of these nine centers that provide online services also provide online access to users in other countries.^{4/} Of particular interest is the expansion of its own online service, CAS ONLINE, from a substance search system to include bibliographic data from the printed Chemical Abstracts since 1967 and the reciprocal agreement between the Chemical Abstracts Service and the Fachinformationszentrum Energie, Physik, Mathematik GmbH (FIZ Karlsruhe) in the Federal Republic of Germany that will provide users in North America and Europe with the capability to access the online data bases maintained by the two organizations.

The computers at CAS and FIZ will be connected by a dedicated telecommunications link, and the two computer systems will use the same software so that one command language can be used for searching the files at both locations. The user

will perceive the network as a single comprehensive system and will be able to search any number of files in one session without being aware that some of the files may be physically stored in a computer on another continent. A particular data base will be loaded at only one site to eliminate duplication in file storage and updating costs. A searcher will access the nearest host computer and will be switched automatically to whichever computer stores the data base to be searched. Access for European users to CAS ONLINE through the FIZ computer will be available early in 1984; users in North America will be able to access the first of the FIZ files by mid-1984, with other FIZ files being made available later that year. The full networking arrangement is expected to be in operation in 1985. The Chemical Abstracts Service's document ordering component can be accessed through CAS ONLINE and several other online data base services, but no mention was made in the announcement of the reciprocal agreement as to whether FIZ would also provide an equivalent service to order its documents. Similarly, no mention was made as to whether the Chemical Abstracts Service's downloading options would also be available from FIZ.

The Institute for Scientific Information, Inc., in Philadelphia, Pennsylvania, collects and disseminates bibliographic data on scholarly information in the sciences, social sciences, and arts and humanities. It, too, provides tapes with appropriate licensing agreements, but unlike the Chemical Abstracts Service, does not provide online access to its data bases for its customers through its own computer facilities. Online access is available only through the commercial data base vendors or through one of the tape licensees. A unique part of ISI's document delivery component, called OATS or Original Article Text Service, is the provision of tear sheets, i.e., the original pages torn directly from the journals in which they appeared, to ensure visual clarity of illustrations, color plates, or graphs. When the supply of tear sheets of an article is exhausted, OATS provides high-quality photocopies. Another recent addition to OATS

is the provision of full-text data or journal articles from the appropriate ISI data base on DIALOG.

The organizations or institutions described above encompass the key players that are involved in transborder flow of bibliographic information. These have been selected on a subjective basis, primarily the ease by which one could obtain information about the organization and its relative importance in the field. Again, it should be emphasized that these organizations were selected to provide examples of the kinds of transborder flow of bibliographic information that takes place.

2.2 PRESENT FLOW OF BIBLIOGRAPHIC DATA

The amount of bibliographic data "crossing" national boundaries is extremely difficult, if not impossible, to determine with any degree of accuracy. Several factors come into play:

- A certain percentage of records transmitted by tape and by online communications consists of updates, revisions, or deletions to records already issued. Although such figures are important in determining total telecommunications usage or cost, they are less meaningful when attempting to determine the number of unique citations or entries in the system. It should also be noted that the tapes exchanged or distributed by the national libraries and library networks and a library network's online cataloging system generate a large number of updated records of one sort or another. This is generally not the case with the abstracting and indexing services or the commercial data base vendors.

- The number of end-users for either tape or online data is generally not known. The Chemical Abstracts Service, for example, has a licensing agreement for its tapes with an information center in England, which in turn provides online services to users in the United Kingdom and possibly through the entire European Community through Euronet/DIANE. Although the use of the records from Chemical Abstracts has to be monitored for the purpose of "royalty" payments, it is likely that the information center, as well as the commercial data base vendors, considers the statistics for the traffic between the user and the center as proprietary information.
- The same records could be transmitted several times among different countries or between countries. For example, UTLAS in Toronto, Canada, receives a tape of MARC records from the Library of Congress in the United States and loads these records into its online data base. One of its users in the United States "claims" a U.S. MARC record, has it transferred into its own file at UTLAS, and subsequently has it downloaded into a microcomputer-based local system located at the user's site. Theoretically, the same record could have crossed the border three or four times.
- The same records are also available through several sources. The MARC records distributed by the U.S. Library of Congress, for example, are distributed in tape form and are included in several of the services mentioned in Section 2.1, e.g., OCLC, UTLAS, DIALOG, SDC, or BLAISE. There are similar overlaps in the data bases created by indexing and abstracting services that are available online through the commercial data base vendors.

The task of estimating the current transborder flow of bibliographic information is virtually impossible to perform because there is no common denominator, such as revenue or volume of activity, among the various groups that are actively involved. Private, for-profit organizations such as corporations may be able to determine the value of information in terms of profits to the firm, but most libraries and information centers operate as not-for-profit organizations or are part of larger not-for-profit organizations and do not have the option of recovering costs.

2.3 ESTIMATES OF FUTURE FLOWS OF BIBLIOGRAPHIC DATA

With reference to the growth of bibliographic data bases available from the commercial sector, Anderla and Petrie in their report, The International Data Market Revisited, state that "the growth rates of the three leading vendors have slowed down over the past few years and their profit ratios have suffered. Their future will depend of how successfully they shed their little used data bases with low earning power, without losing too many customers, whilst concentrating on the marketing of the more profitable subjects."⁵/ It should be noted that the emphasis is on revenue, not volume of activity.

In reviewing the other organizations or institutions described in Section 2.1, it seems unlikely that the total number of groups involved in transborder data flow would increase substantially within the next five to ten years, with the possible exception of Euronet/DIANE. Starting with the category of the national libraries or national bibliographic agencies, implementation of MARC tape distribution services by those countries that are already listed in the table would increase the number of agencies by about thirty-five percent but would add a much smaller percentage to the total number

of records available throughout the world. The trend for organizations such as the National Library of Medicine appears to be that as the different foreign centers obtain the necessary hardware, software, staff, and expertise to handle the files and have the requisite volume of activity, they will shift from direct online access to obtaining tape files, from which they can create their own products and online access. It is unlikely that the total number of licensees for either the National Library of Medicine or the abstracting and indexing services' files will increase substantially. On the other hand, the communications link between the Chemical Abstracts Service and FIZ, Karlsruhe, will probably increase the number of accesses made to both systems from different countries.

The number of participants in INIS or AGRIS may show a modest increase in the next five to ten years. Similarly, the bibliographic utilities may see modest growth. The one area that has the greatest potential for growth as far as the bibliographic utilities are concerned is the development of local processing systems with links to the large files maintained by the networks. In the United States, this development has been taking place because of the increasing interest in local online public access catalogs and will probably expand further as the costs of telecommunications rise over the next few years, making it necessary to perform more processing at the local level and reduce the amount of traffic between the mainframe computer and the local system. Libraries and information centers in other countries may find these systems well-suited to the size of their collections and budgets.

EuroNet/DIANE is probably unique among these organizations in that its sole purpose for existence is transborder data flow, albeit within the confines of the European Community. Although traffic over the network has increased by over sixty percent in each year since it was implemented in 1980,^{6/} even the most optimistic

projections bring the gross revenues to less than a third of the amounts projected for the United States.7/

2.4 COMPARISON WITH INTERNATIONAL CIRCULATION OF OTHER TYPES OF DATA

Similar caveats must be made when attempting to estimate the transborder flow of other non-personal data. If provided at all, the flows are described in terms of dollar amounts (e.g., total costs for the activity or savings) or possibly in terms of volume of activity. This segment of the market is also continuing to experience growth. In 1982, the source data bases consisting of numeric, textual, or a combination of numeric and textual constituted an estimated sixty-five percent of the total number of online data bases.8/

Scientific data in machine-readable form can range from remote-sensing satellite data to data on chemical compounds or chemical structures. Data from the Landsat satellite operated by the U.S. Dept. of Commerce are converted by computer to magnetic tapes and "earth pictures" that are presently sold to any customer. Policy changes have been proposed to sell all or part of this operation to a private contractor. The dollar amounts involved are not inconsequential; the Commerce Dept. has recently requested approximately \$20.4 million from the U.S. Congress just to launch a replacement for the existing satellite.9/ Figures for the sale of the digital tapes for the period between 1976 and 1980 indicate an increasing number being sold to non-U.S. customers. Unfortunately, these figures were expressed in percentages rather than in actual numbers.10/ Another facet of the use of Landsat data is in the cooperative programs with various national centers. In Brazil, for example, the Brazilian Institute

of Space Research processes raw data received from Landsat and is the "designated contractor" for outputs related to Brazilian territory. The outputs consist of an online data base, computer tapes, high resolution negatives, or black and white or color photographs.

The Institute for Scientific Information has recently announced that a French firm, Télesystèmes-Questel, will be providing online access for ISI's Current Abstracts of Chemistry and Index Chemicus, which is presently available only in printed form and on magnetic tape. Although this file is essentially bibliographic in that the data base covers articles in about 110 organic and pharmaceutical journals, it is mentioned here because Questel will be able to provide graphic searching capabilities whereby a chemical compound can be searched by a detailed chemical structure diagram rather than by words. Availability is expected early in 1984.

Economic and financial data are of three types: textual, numeric, or a combination of textual and numeric. An increasing number of organizations such as I. P. Sharp in Canada or CISI in France offer, in addition to their numeric data bases, time and simulation models on a time-sharing basis. Reuter, the international news agency based in London, began to supplement its news income by supplying New York stock market prices to Europeans through computer transmission in the early 1960s and by 1973, introduced a system called Monitor to exchange currency rates among traders. In 1983, the 14,000 subscribers in seventy-four countries can access the system through 34,000 Monitor terminals and obtain a wide variety of services, such as up-to-the-second information on the price of metals, cocoa, oil, gold bullion or shipping information. Estimates place the overall value of the agency on the open market at about \$2 billion.11/

Service firms such as banks, airlines, or credit card systems are heavily involved in transborder data flow. International networks in banking and air transportation exist that prove the necessity of cooperation among smaller firms. In 1982, SITA (Société internationale de télécommunications aéronautiques) and SWIFT (Society for Worldwide Interbank Financial Telecommunications) handled 5,700 million messages over a network of leased lines shared by 243 airlines (SITA) and 350,000 messages daily among 1,017 banks in forty-four countries (SWIFT).^{12/} The larger airlines and banks supplement their respective industry network with their own private networks to provide services beyond those available through either SITA or SWIFT. Authorization functions are critical in credit card systems because loss from counterfeit cards in 1982 totalled an estimated \$40 million, from the use of stolen cards, \$200 million.^{13/} Response time is expected to be a matter of seconds from anywhere in the world.

Data in the social sciences, like economic data, consist of textual, numeric, or a combination of textual and numeric data. The distinction between social science data and economic data is not always apparent. For example, "BLS Labor Force," a data base produced by the Bureau of Labor Statistics, U.S. Dept. of Labor, is derived from the Current Population Survey conducted monthly by the U.S. Bureau of the Census for BLS and could fit in both categories. Although the number of data bases in this area is quite large, their use in an online mode in countries other than the one in which they were created is not known. Organizations like the Inter-University Consortium for Political and Social Research, located at the University of Michigan, Ann Arbor, obtain magnetic tapes from a number of foreign academic or research institutions, and presumably a certain number of tapes created in the United States are obtained by foreign centers active in comparative social science research. Again, the number of tapes involved in transborder flows is not known.

Computer-aided design (CAD), computer-aided manufacturing (CAM), or computer-aided engineering (CAE) are used in international networking by many transnational corporations. A recent article cited savings of \$1 million in telecommunications costs for Honeywell, Inc., with the introduction of networking software, which supported, among other things, multiple networks in Canada, the United Kingdom, France, West Germany, Japan, and Australia.^{14/} Through connections in Arizona and Massachusetts, Honeywell is linked to its foreign installations through value-added networks or through the PTTs in Europe. The manufacturing facility in Phoenix can obtain inventory information and develop production schedules while software engineers have access to many centralized data bases. Another benefit of the network is that Honeywell's divisions can serve as test sites for new products. Similar examples of transborder data flow have been cited in the literature.^{15/} Finally, the availability of online "citations" to patents and trademarks has become an increasingly important service for both the traditional bibliographic online vendors like DIALOG, SDC, or BRS and for other online vendors. As noted earlier, patents fall somewhere between bibliographic data bases and source data bases. A number of bibliographic data bases like Chemical Abstracts contain citations to patents in a particular field.

Other researchers have cited the lack of adequate statistical data to show precisely what types of data are moving across borders, how much data traffic flows internationally, and how critical these data are.^{16/} Even the most extensive study performed to date, the joint Business and Industry Advisory Committee/Organization for Economic Cooperation and Development survey of international enterprises, yielded relatively little quantifiable data although it identified a number of trends.^{17/} Perhaps identifying and monitoring trends are about all that could be accomplished at this point.

NOTES:

- 1/ Memo from the Library of Congress Network Development Office, "Countries Having MARC Tape Distribution," Dec. 16, 1983. 1 p.
- 2/ "Euronet DIANE: 3 Years Progress," Euronet DIANE News, no. 30 (Feb./Mar. 1983): 1. Depending on how bibliographic and non-bibliographic are defined, these percentages could vary.
- 3/ Input does not have to be in machine-readable form, i.e., it can consist of input worksheets, but the principal emphasis is placed on the machine-readable media for the purposes of this paper.
- 4/ "Information Centers That Provide Services Based on Files Licensed from Chemical Abstracts Service," (1983?), 6 p. These numbers were derived from the fact that the centers consisted of commercial online data base vendors in the United States or in Europe or of institutions that were known to have either their own online networks or have access to networks like Euronet/DIANE.
- 5/ Organization for Economic Cooperation and Development, Directorate for Science, Technology, and Industry, The International Data Market Revisited. By G. Anderla and J. H. Petrie. DSTI/ICCP/83.25. (Paris: OECD, 20 Oct. 1983), p. 30.
- 6/ "Euronet DIANE: 3 Years Progress," Euronet DIANE News, no. 30 (Feb./Mar. 1983): 1.

- 7/ Organization for Economic Cooperation and Development, Directorate for Science, Technology, and Industry, The International Data Market Revisited, p. 11.
- 8/ Directory of Online Databases, by Ruth N. Cuadra, David M. Abels, Judith Wanger, eds. (Santa Monica: Cuadra Associates, 1982).
- 9/ Arlen J. Large, "U.S. Abandons Sale of Weather Satellites; Earth-Picture System May Still be Offered," Wall Street Journal, (Nov. 14, 1983): 7.
- 10/ United Nations Centre on Transnational Corporations, Transnational Corporations and Transborder Data Flows: A Technical Paper. ST/CTC/23. (New York: United Nations, 1982), p. 107.
- 11/ Peter Osnos, "Reuter Plans to Go Public After Bonanza," Washington Post, (Nov. 13, 1983): G19.
- 12/ Organization for Economic Cooperation and Development, Directorate for Science, Technology, and Industry, Transborder Data Flows in International Enterprises: Based on Results of a Joint BIAC/OECD Survey and Interviews with Firms. DSTI/ICCP/83.23. (Paris: OECD, 17 Oct. 1983), p. 22, 27.
- 13/ Organization for Economic Cooperation and Development, Directorate for Science, Technology, and Industry, Transborder Data Flows in International Enterprises, p. 28.

- 14/ Robert Batt, "International Net Saves Honeywell \$1 Million," Computerworld, (Nov. 28, 1983): 38.
- 15/ Organization for Economic Cooperation and Development, Directorate for Science, Technology, and Industry, Transborder Data Flows in International Enterprises, p. 12-13, 16-17.
- 16/ Jane Bortnick, International Data Flow Issues. Issue Brief No. IB81040. (Washington: Library of Congress Congressional Research Service, Originated 12/14/79, Updated 1/6/84), p. 4.
- 17/ Organization for Economic Cooperation and Development, Directorate for Science, Technology, and Industry, Transborder Data Flows in International Enterprises, p. 3.

3. BARRIERS TO THE FLOW OF BIBLIOGRAPHIC INFORMATION

3.1 WHAT ARE THE BARRIERS?

Appendix A contains a table indicating the trade barriers to telecommunications, data, and information services. This information, which was originally compiled by the Office of the U.S. Trade Representative, is adapted from a chart that appeared in Information Hotline in January 1982. Barriers that have had effects or may have effects on transborder flow of bibliographic data are described below.

- **Network controls:** Restrictions on the availability of leased lines or on the degree of interconnection of private lines leased by data processing and data base service vendors or transnational corporations

At least two of the value-added networks used by commercial data base vendors have indicated that problems have existed in the past.¹/ In addition, OCLC has experienced some difficulty in establishing private line links in the United Kingdom.

- **Technical/standards barriers imposed on computer and data telecommunications hardware**

Since there has not been any documented evidence of such barriers, they remain only a potential threat to hardware manufacturers. If such standards or regulations were actually implemented, they may affect the marketing efforts of certain commercial data base vendors or library bibliographic utilities that require use of dedicated hardware for its systems.

- **Access to Euronet**

Commercial data base vendors from non-European countries have indicated that their customers in Europe have to pay three to four times more to access their data bases through the local PTTs compared to the prices charged by Euronet/DIANE.^{2/} Two of the vendors that specialize in bibliographic data bases also noted that a number of the data bases available through Euronet/DIANE had been created in the United States, often by U.S. government agencies, and because of the discriminatory pricing for non-European hosts, access to these data bases are considerably more expensive through the vendors' systems.

- **Policies requiring data processing functions to be performed within a country**

These policies may have some implications for foreign online data base vendors and online bibliographic utilities, particularly if they provide input/update capabilities as part of their services. Exceptions, e.g., the CONSER link between OCLC and the National Library of Canada, have been made in the past, probably because the volume of traffic is relatively low.

- **Telecommunications rates and rate increases predicated on considerations other than cost**

Specific evidence is lacking, but if such policies were implemented, they would affect foreign online data base vendors and online bibliographic utilities.

- **Tax on information: Value-added tax**

The specific example cited was a tax on microfilm documents imported from non-European countries. There may be possible implications for commercially-produced COM catalogs from foreign vendors. If such a tax is placed on software on a disk, the implications are far greater because of the growing popularity of microcomputers.

- **Restrictions on commercial visas which limit the ability of vendors to market and maintain their services**

Although such policies would have an effect on all organizations involved in bibliographic data, no evidence has been cited by any of those involved.

Other barriers, such as Import Controls on Data Communications Hardware, have long-term implications for organizations that market local bibliographic processing systems. A recent article in the Wall Street Journal described IBM's efforts in Brazil to have government restrictions on foreign companies selling small computers lifted.^{3/} In the meantime, OCLC has announced the availability during the first quarter of 1984 of the OCLC M300 workstation, an IBM Personal Computer to which OCLC has added special hardware and software to access the OCLC online system. The M300 will have the capability to handle the services offered by OCLC as well as the functions of the stand-alone IBM Personal Computer. If, therefore, IBM is permitted to market items like the Personal Computer in countries like Brazil, OCLC's marketing of the M300 workstation will also be facilitated.

It should be noted that since the list of barriers had been prepared by the Office of the U.S. Trade Representative, the restrictions placed by the United States

government itself have not been included. Donoghue cites an example where the U.S. government gave as one reason for withdrawing financial support for an international research organization the fact that the institution had access to the commercially available DIALOG data base.^{4/} The commercial data base vendors have also been caught in restrictions placed on "technology transfer" to certain countries because these restrictions have been expanded to include information on new technology.^{5/}

Although the table prepared by the Office of the U.S. Trade Representative includes as one trade barrier the lack of patent or copyright protection, the problem that has occurred with machine-readable bibliographic data has been the presence of copyright for data received from certain national libraries through tape exchanges. Although this particular problem has been worked out in the agreements for the tape exchanges, it has been raised in a slightly different form because one of the bibliographic utilities is not able to separate those records in its data bases when attempting to operate in the country in which the records originated. In addition, the U.S. Library of Congress has instituted an agreement for its tape subscription services beginning on April 1, 1983, that states: "The Customer will not copy nor redistribute the LC MARC tapes in the form received under this subscription to another party. The Customer may copy or redistribute/on (sic) a record by record basis to another party only those MARC records which have been modified or otherwise claimed for local cataloging use." These restrictions inadvertently affected transborder data flow because several foreign institutions subscribing to the tape services had been copying the tapes for smaller institutions in the country.

3.2 CONSEQUENCES OF THESE BARRIERS

In reviewing the table listing trade barriers in Appendix A, it is evident that in virtually all cases, the motivations for imposing the barriers appear to be valid. The policies in effect in countries like Brazil have been well documented in the publication Transborder Data Flows and Brazil, in which the common theme undergirding government policies includes statements such as "encourage local production of software," develop "software that minimizes use of imported equipment," or "protect the country's integrity by administering transborder data flows in such a manner that Brazil's networks do not become mere appendices of networks abroad."6/

It is interesting to note some of the policy changes proposed in different countries, probably the result of publicizing the problems encountered in transborder data flow. Two bills have been introduced in the U.S. Congress in 1983: (1) H.R. 2297 amends the Communications Act of 1934 to authorize the Federal Communications Commission to regulate entry of foreign telecommunications services and carriers into U.S. markets, making the terms of such entry reciprocal to the terms applied to U.S. telecommunications services and carriers in the nation in which the foreign service or carrier is based or under the laws of which the foreign entity is established; and (2) S. 999 promotes competition among providers of international telecommunications facilities and services by authorizing the FCC to classify or reclassify as regulated international telecommunications services and thereafter to deregulate services as they become competitive.7/

In a recent statement made by the Vice President for Strategic Planning (Retail Banking) of the Royal Bank of Canada, the importance of transborder data flow was emphasized: "... we also know that many transborder data flow issues can only be

resolved through governmental agreement. And we greatly fear that in the absence of such agreement, individual governments will move unilaterally, thereby causing an outbreak of information protectionism which could seriously threaten the prospects of economic recovery. More specifically, we not only fear that information protectionism will directly threaten the prospects for tertiary industries--it will indirectly damage the ability of primary and secondary industries to improve their productivity through the application of modern technology and know-how. It was with this in mind that our chairman . . . recently proposed to the Government of Canada that Canada and the United States commence bilateral negotiations to harmonize privacy protection in each country and create a framework to govern trade in computer services."8/

Policy-makers, therefore, are not only cognizant of the issues but also are working to resolve the problems of transborder data flows through organizations like the Organization for Economic Cooperation and Development or at bilateral or national levels. In at least one case, pressures from industries affected by transborder data flow policies appear to have prompted some reconsideration of these policies.9/

Although bibliographic data constitute a very small subset of the total transborder flow of information, its importance to research in all fields of knowledge, but most particularly in fields related to science and technology, to the educational process in a country, and to a country's industrial, technological, agricultural, or cultural development cannot be overlooked. Free flow of information, in this case meaning free of impediments other than cost, is a concept that should be understood by all information professionals and could be easily tied in with IFLA's medium-term program for the Universal Availability of Publications.

Costs, however, are still a primary factor in limiting the availability of bibliographic data and, hence, of publications in much of the world. In its report, Transborder Data Flows: Access to the International On-line Data-Base Market, the United Nations Centre on Transnational Corporations provides several courses of action for lesser developed countries.^{10/} International information systems such as the International Nuclear Information System have attempted to alleviate this problem in at least one way by requiring that all citations for non-conventional documents (e.g., scientific and technical reports, patents, non-commercially published theses and dissertations, or standards) contributed to the system be accompanied by the source document, which is subsequently filmed and made available to the national centers on microfiche.

If the barriers to transborder flow of bibliographic data are the result of barriers motivated by broader issues, e.g., protection of "infant" industries, the prospects for removing them gradually over time are fairly good. If, however, these barriers occur because of different traditions, such as one country's government-produced machine-readable bibliographic data are protected by copyright but another country's data are not, it is less likely that satisfactory solutions will be found for all the parties involved. Traditions are notoriously difficult to change, as some U.S. government agencies discovered when they tried to extend copyright protection to U.S. government documents and machine-readable data. This proposal was rejected, not because of reasons related to transborder data flow, but because it was antithetical to the basic philosophy of equal opportunity for access to information and generated active and vocal opposition from the library and information service profession and the for-profit sector in the United States.

Barriers to transborder flow of bibliographic information have long-term implications for the international library and information service profession and the constituents they serve because they tend to promote insularity at a time when open and rapid communications among nations are needed. Impediments related to access to online bibliographic data bases may also preclude participation in a more important aspect of library and information services: electronic document delivery. As retrieval systems attempt to merge functions like indexing with full-text delivery of materials with superior graphics capability, economies of scale become critical in lowering the costs of these services to be affordable for the majority of potential users. Rapid, efficient, high-quality, and affordable document delivery is still one of the biggest problems facing the library and information service profession despite the fact that considerable progress has been made in the last decade in the area of online bibliographic systems.

NOTES:

- 1/ Statements of Warren Burton, Vice President, Tymshare, Inc., Cupertino, Calif., and Philip Walker, Vice President and General Counsel, GTE-Telenet Communications Corp., Vienna, Va. In U.S., House, Committee on Government Operations, International Data Flow; Hearings before a Subcommittee . . . 96th Congress, 2nd sess., March 10, 13, 27; and April 21, 1980. (Washington: U.S. Govt. Print. Off., 1980), p. 61-63, 80-82.
- 2/ Letters submitted by Roger K. Summit, Director, Information Systems, DIALOG Information Retrieval Service, Palo Alto, Calif., George E. Mueller, Chairman and President, System Development Corporation, Santa Monica, Calif., and Otto Eckstein, President, Data Resources, Inc., Lexington, Mass. In

U.S., House, Committee on Government Operations, International Data Flow, p. 683-85, 653-56, 674-75.

3/ Julia S. Michaels, "IBM Mounts Publicity Drive in Brazil, Hoping Computer Restrictions Will End," Wall Street Journal, (Jan. 13, 1984): 27.

4/ Hugh P. Donaghue, "Implications of Transborder Data Flows to Library Networks," IFLA Journal, 9, no. 1 (1983): 34.

5/ "Is Information 'Special'?" Monitor, no. 12 (Feb. 1982): 13.

6/ United Nations Centre on Transnational Corporations, Transborder Data Flows and Brazil. ST/CTC/40. (New York: United Nations, 1983) 418 p.

7/ Jane Bortnick, International Data Flow Issues. Issue Brief No. IB81040. (Washington: Library of Congress Congressional Research Service, Originated 12/14/79, Updated 1/6/84), p. 5.

8/ J. C. Grant, New Financial Services and Transborder Data Flow. Prepared for delivery to OECD Second Symposium on Transborder Data Flow, London, England, November 30-December 2, 1983. p. 10-11.

9/ Michaels, "IBM Mounts Publicity Drive in Brazil, Hoping Computer Restrictions Will End." p. 27.

10/ United Nations Centre on Transnational Corporations, Transborder Data Flows: Access to the International On-Line Data-Base Market. ST/CTC/41. (New York: United Nations, 1983) p. 112-120.

4. PROPOSALS FOR ACTION

Since most of the problems affecting transborder flow of bibliographic information originate in the broader area of all transborder data flow, their resolution lies in the formulation of policies at the highest level of government where trade agreements, protocols, or guidelines are initiated. Under such conditions, what courses of action can be taken by the library and information profession?

- Effects of barriers to transborder flow of bibliographic information, real or potential, need to be communicated to the appropriate agencies. Most officials recognize the pivotal role of information, including library materials, in a nation's economy, and in many instances, the negative impact on bibliographic data was not intended.
- In order to educate the officials, the library and information profession has to educate itself on the issues related to transborder data flow. Ironically, one of the biggest problems is identifying and obtaining the important reports in this area because many of them are disseminated as working documents to a limited audience. Perhaps IFLA or some other group could be responsible for the overall effort, with the actual dissemination of information handled by the national library association and/or the national library in the individual countries. Regular updates, perhaps on a biennial basis, could be presented at IFLA conferences.
- Although the composition and the roles of the public/private, for-profit/not-for-profit sectors vary in different countries in terms of their information

requirements and participation in providing library and information services, more and better communications should be established among them. The problems of the Information Age, such as transborder data flow, are not unique to any one category or group but will eventually affect all of them.

- Bibliographies, such as the one included in the report International Telecommunications and Information Policy: Selected Issues for the 1980's prepared for the U.S. Senate Committee on Foreign Relations, could be used as a starting point.^{1/} Since it was compiled in the United States for the United States Congress, the publications cited are in English or have been translated into English and are readily available in the U.S. Expansion to cover documents from other countries would require efforts to identify and obtain them and subsequently translate them into the official languages.
- One of the recommendations made to IFLA concerning copyright of machine-readable bibliographic records was: "IFLA or some other organization should advance the understanding of the economic issues surrounding the international exchange of bibliographic data, possibly through the performance or sponsoring of a cost-benefit study of such relationships among the national bibliographic agencies. At the least, the volume of exchange of bibliographic data should be monitored on a regular basis."^{2/} In terms of transborder data flow, such an understanding should include the economic issues related to online data bases, both bibliographic and non-bibliographic, although on a much general level than what could be performed for tape exchanges among national libraries.

Statistical data on all aspects of transborder data flow are obviously lacking, and although bibliographic information in machine-readable form constitutes a subset of

the larger category of non-personal data, it is equally difficult to quantify in terms of transborder flows. With the limited resources available, it would be more advantageous to focus on efforts that could be put into place within a two- to three-year timeframe.

The problems related to transborder data flow did not exist before the advent of the Information Age. It, therefore, behooves one of the key providers of information, library and information professionals, to understand these complex issues and work cooperatively toward a mutually agreeable solution.

NOTES:

- 1/ International Telecommunications and Information Policy: Selected Issues for the 1980's. A Report Prepared for the Committee on Foreign Relations, United States Senate, by the Congressional Research Service, Library of Congress. 98th Congress, 1st sess. S. Prt. 98-94. (Washington: Library of Congress, 1983), p. 34-38.
- 2/ Dennis D. McDonald, Eleanor Jo Rodger, and Jeffrey L. Squires, "Findings of the IFLA International Study on the Copyright of Bibliographic Records in Machine-Readable Form," IFLA Journal, 9, no. 3 (1983): 219.

APPENDIX A

TRADE BARRIERS TO TELECOMMUNICATIONS, DATA, AND INFORMATION SERVICES

The chart on the following pages was prepared from information provided by the Office of the U.S. Trade Representative and adapted from a table appearing in Information Hotline (January 1982). Although considerable progress has been made on some issues affecting certain countries, references to the issue have been left in the chart to indicate the kinds of problems that existed a few years ago. Because the original charts did not separate the bibliographic implications from the overall trade implications of the issue, a separate column has been added to indicate some of the potential effects of the policies.

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Network controls: Restrictions on the availability of leased lines	Various policies and administrative practices to discourage or deny the leasing of private circuits (EC)	Increases revenue earnings for PTTs by increasing traffic on usage-sensitive public networks Promotes local data processing and data base service companies Promotes public data communications networks	Increases cost to large users of data communications; present level of data communications may become economically unfeasible Reduces efficiency of communications transfer because in many instances, public network facilities don't provide desired quality of service Severely retards advances in teleprocessing if private circuits are eliminated; many existing teleprocessing systems will be degraded	Restricts availability of services from foreign online data base vendors and online library networks
Network controls: Restrictions on the degree of interconnection of private lines leased by data processing and data base service vendors	Private leased lines available to data processing and data base service vendors on condition that the circuit only be connected to a single computer system in a single location abroad	Increases revenue earnings for PTTs by tying interconnection to use of usage-sensitive public networks Promotes local data base and data processing service companies	Increases cost to users Reduces efficiency of communications transfer because in many instances, public network facilities don't provide desired quality of service Prohibits foreign vendors from marketing full line of services	Restricts availability of services from foreign online data base vendors and online library networks

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Network controls: Restrictions on the degree of interconnection of private lines leased by TNCs (transnational corporations)	Effective 1 Jan. 1982: (1) International leased lines prohibited from being connected to public networks unless the connection is made via a computer which carries out at least some processing; (2) international leased lines available only if guaranteed that not used to transmit unprocessed data to foreign public telecommunications networks (Fed. Rep. of Germany)	Increases revenue earnings for PTTs by funneling data to usage-sensitive public networks	Increases cost to users, particularly smaller users Reduces efficiency of communications transfer because in many instances, public networks do not provide desired quality of service	Not applicable
Technical/standards barriers imposed on computer and data telecommunications hardware	Details needed	Promotes local manufacturers of computer and data telecommunications equipment Excludes foreign data processing service vendors from accessing local telecommunications network	Affects the ability of companies to export data communications hardware Long waits common for even the simplest requirements Inhibits quality of data communications system Prohibits or limits opportunities of foreign vendors to provide services	May restrict foreign online data base vendors, online library networks, or other commercial library vendors from using dedicated terminals, microcomputers, etc.
Access to Euronet	Excluding foreign vendors using computers outside Europe (EC)	Promotes the information industries of EC member countries	Excludes non-EC member country firms from market	Excludes online data base vendors from non-EC member countries

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Policies requiring data processing functions to be performed within a country	International links for teleprocessing systems subject to approval by government as part of its informatics policy. Principal criteria used to evaluate requests: (1) protection of country's labor market, and (2) protection of operations of national firms and organizations. All data links approved are reviewed for renewal after three years (Brazil)	"Infant industry" protection for data processing service industries	Limits opportunities of foreign vendors to provide services in Brazil Presumably as data processing and software capacities increase, government may deny requests for international data links more frequently Increases cost to users since Brazilian computing services are expensive relative to foreign vendors	Possible implications for foreign online data base vendors and online library networks
	Law in place currently not exercised; gives SCT exclusive rights to provide online data processing services (Mexico)	"Infant industry" protection for data processing service industries	Limits opportunities of foreign vendors to provide services to Mexico Excludes foreign competition	Possible implications for foreign data base vendors and online library networks
	Effective 1 Jan. 1982: Requires local processing of data prior to its transmission outside of country (Fed. Rep. of Germany)	Promotes local data processing industry	Restricts business opportunities for foreign DP service companies	Possible implications for online library networks
	Bank Law interpreted by banking authority as requiring total processing of financial information within the country, thereby excluding possibility of online processing elsewhere (Fed. Rep. of Germany)	Promote local data base and data processing service companies	Increases cost and decreases efficiency of foreign banks	Not applicable

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
	Recommended to TNCs operating in country that data processing of its operations be done in that country. Although only a recommendation, TNCs feel constrained to maintain local data processing facility although all data processing could be done in another country at lower price (Canada). Canadian Banking Act of 1980 requires banks operating in Canada to maintain and process in Canada all data pertaining to bank customer; Vancouver Real Estate Board prohibited from subscribing to computer-generated "property sales" because data on Canadian real estate in book processed by computer outside Canada.	Promote local data processing industry Promote employment of nationals	Increases cost to users Restricts business opportunities for foreign data processing service companies	Potential implications for online data base vendors and online library networks
	Requirement that information about a bank customer be physically retained in the country (Korea)		Increases cost and decreases efficiency of foreign banks	Not applicable
	Requirement that a bank obtain written permission from a customer before it can transmit data about the customer out of the country (Singapore)		Increases cost and decreases efficiency of foreign banks	Not applicable

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Restrictive actions related to right of establishment	Partial local ownership and local content requirements for the manufacture of certain data communications hardware (Brazil, Mexico)	Develop and protect local industry	Eliminates manufacturing and/or marketing of certain equipment Discriminates against foreign investment	?
Discriminatory government procurement practices: Data communications hardware	Current NTT procurement from Japanese-owned companies only (Japan)	Develop and protect local industry	Exclusion of foreign competition (N.B.: Some restrictions removed recently)	?
Discriminatory government procurement practices: Data processing services	Details needed			
Import controls on data communications hardware	As part of informatics policy, imports of computers and other data communications hardware are subject to approval by the government. Principal criteria used in evaluating requests for imports: (1) protection of operation of national firms and organizations, (2) protection of country's labor market (Brazil)	"Infant industry" protection for computer industry	Restricts foreign manufacturers from market Increases cost and operational efficiency of users. (Example: bank operating in Brazil denied permission to import a computer which would have reduced operational costs substantially; bank had to purchase domestically available computer with capacity far in excess of needs, resulting in drastic reduction of anticipated savings.)	?

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Excessive tariff on data communications hardware	17% tariff imposed on integrated circuits; anticipates efforts to broaden definition of integrated circuits to include mounted boards as well (EC)	Protection of EC-member countries' manufacturers	Discourages foreign imports	?
Government support of data processing industry	France, 1980-85, \$300 million; Fed. Rep. of Germany, 1980-83, \$540 million; Italy, 1979-81, \$355 million; UK, 1979-83, \$340 million; Sweden, 1979-82, \$111 million	Promote local data processing industry	Fosters competitive advantage for local firms	?
	Absorbs operating losses in face of competition; joint or sole government ownership of industrial property (Japan)	Protection of government-provided data communications (NTT)	Limited opportunity to compete for other data communications service enterprises	?
		Foster local industry through government participation in R&D (MITI, NTT)	Patent licensing by commercial enterprise restricted	
Davignon Plan to promote European-based DP, telecommunications, and microelectronic industries through community-wide standards, procurement, and subsidies	Capture one-third of world market for European-based industry by 1990 (EC)		Probable discrimination against non-European-based suppliers	?

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Telecommunications rates and rate increases predicated on considerations other than cost	Details needed (EC, Japan)	Avert continued growth of private networks Promote "in-country" data processing Promote public data communications networks	Increases cost to users Provides competitive advantage for local data processing service firms	Possible implications for foreign online data base vendors and online library networks
Tax on information: Value-added tax (VAT)	4% duty and 8% VAT levied on all microfilm documents and publications imported from non-EC countries. Levy affects only microfilm brought into the country for resale to public or to service a client. Tax applied only to microfilmed information, not its paper equivalent (UK)	Promote local information industries Increase revenue earnings	Growing concern that in the future, value-added tax to be placed on data processed abroad as a means of promoting local vendors	Possible implications for commercially-produced COM catalogs from foreign vendors
Restrictions on commercial visas which limit the ability of firms to market and maintain their services	Various discriminatory regulations and administrative practices which make it difficult for qualified personnel to enter country (Canada, Belgium, Brazil, Fed. Rep. of Germany, Switzerland)	Promote local products	Limits sales opportunities If after-sale service is restricted, product becomes less attractive relative to domestic counterpart	Possible effects on commercial online data base vendors
Limitation on foreign equity in a service firm	Local ownership requirement of 40% for data processing service companies and communications equipment manufacturers (Nigeria)	Promotes Nigerian enterprises	Discriminates against foreign investment	?

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Limitation on foreign equity in a service firm	Details needed (Brazil, Israel, Netherlands, South Africa)			
Restrictive foreign exchange regulations	Refusal to allow fund transfers or unrealistic limitations on the amount of funds permitted in or out of the country with which to establish or operate data service enterprise (Belgium)	Protect local enterprises	Discriminates against foreign investment	?
Restrictions on the flow of non-personal data	Several countries, notably France, considering data protection laws restricting the flow of information pertaining to natural resources, development plans, government operations and budgets, government-owned or government-supported industries, and certain economic indicators (EC)	Promote local data base and data processing service companies Provide local firms with a competitive advantage over TNCs with regard to local markets	Affects the ability of TNCs to obtain the information they need for their foreign operations Restricts sales opportunities of foreign data base and data processing service companies	?
Privacy laws extended to include legal persons	(Denmark, Austria, Norway, Luxembourg)	Provide local firms with competitive advantage over TNCs	Proprietary business information may be forced to become public information	?

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Misapplication of privacy/data protection laws		Promote local data base and data processing service companies	Greatly impair business activities of TNCs, particularly information intensive enterprises like banks, credit card companies, airlines, transportation, securities, money market Restrict sales opportunities of foreign data base and data processing companies	?
Lack of patent and copyright protection	Copyright and trademark infringements. Details needed (Australia, Austria, Belgium, Brazil, Canada, France, Fed. Rep. of Germany, United Kingdom, Greece, Hong Kong, Indonesia, Lebanon, Israel, Saudi Arabia, South Africa, Philippines, Switzerland, Sweden, Venezuela, Mexico, Netherlands)			Details needed
Participation in multi-access automated reservation system (SST). Full participation in Air France reservations system	SST system to be available to foreign participation in Air France system; however, authorities unwilling to force Air France to accept foreign competitors (France)	Maintain competitive advantage for national airline(s)	Loss of market access measured in terms of traffic and revenue	Not applicable

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Participation in multi-access automated reservations system (SIARI)	Authorities take position that matter is outside their jurisdiction (Fed. Rep. of Germany)	Maintain competitive advantage for national airline	Non-participating airlines at a severe competitive disadvantage in selling transportation in Germany	Not applicable
Import duties on automated reservations system equipment	31.5% import duty. Equipment available locally doesn't meet carrier's requirements (Greece)	Revenue. Protect local industry and/or suppliers	High level of duties makes it difficult to justify automation	Not applicable
	57% import duty. Equipment available locally does not meet carrier's requirements (Israel)	Revenue. Protect local industry and/or suppliers	High level of duties makes it difficult to justify automation	Not applicable
	25% import duty. Equipment available locally does not meet carrier's requirements (Italy)	Revenue. Protect local industry and/or suppliers	High level of duties makes it difficult to justify automation	Not applicable
	57% import duty. Equipment available locally does not meet carrier's requirements (Spain)	Revenue. Protect local industry and/or local suppliers	High level of duties makes it difficult to justify automation	Not applicable
	41% import duty. Equipment available locally doesn't meet carrier's requirements (Egypt)	Revenue. Protect local industry and/or local suppliers	High level of duties makes it difficult to justify automation	Not applicable
Automated passenger check-in at airport	Refusal to accept carrier's request for automation on ground that law gives monopoly handling organization exclusive rights to render such service (Italy)	Maintain competitive advantage for national airline	Unfair competitive advantage for Italian airlines	Not applicable

Major Issue	Specific Type of Barrier Applied	Motivations for Imposing Barriers	Trade Implications	Bibliographic Implications
Discrimination in customs valuation between computer and data processing services transmitted through telecommunications network or transferred through physical software products	Details needed (Brazil, Canada, UK, Israel, South Africa, Venezuela)			?
Discriminatory licensing restrictions	Details needed			?

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